

AMATEUR SATELLITE REPORT

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AMSAT OSCAR 13 Wyoming DXpedition

Utah area coordinators Steve Peterson, KI7L and Wally Nelson, W7KRC traveled to Evanston, Wyoming and operated OSCAR 13 for over six and one half hours on the 24th/25th of September. A portable OSCAR station was assembled in the front yard of Dave Smith, WA7MEK, on a hill overlooking the city of Evanston. This site provided continuous access to OSCAR 13 until transponder shutoff at about 05:10 UTC. The expedition provided Dave with his first satellite contact and 35 amateurs with a Wyoming QSO. Signal reports varied between 42 and 57. Frequently QSO's were of armchair quality with little or no spin flutter. Some of the stations worked included: KP4KKG, XE1TU, WBØRLY, K6UGS, KL7GRF, VE5TK, JEØJDY, JA1GYT, WA2LQQ, HC2FG/HC8, and DD3NJ. Gus, HC2FG, was also portable from the Galapagos Islands. Operation occurred on both Modes B and J. Best signals occurred early in mode B after Mode J transponder operation.

AO-13 Shifts To New Ops Sked

AO-13 operations continue normally after the first major schedule change. The new schedule was placed in effect September 21 and accommodates the new spacecraft attitude. The new attitude (Bahn Longitude 210, Bahn Latitude +5) is mandated by the position of the sun relative to AO-13's orbital plane. The attitude change began September 19 and was completed in a few orbits.

AO-13's attitude (its orientation respect to its orbital plane) is adjusted using its on-board magnetorquers. These are large electromagnets in each arm of the spacecraft which, when pulsed, interact with the geo-magnetic field to produce a net torque on the spacecraft. Activation of the magnetorquers is accomplished under automatic control of the on-board Integrated Housekeeping Unit (IHU) around the time of perigee. The geo-magnetic field is strongest close to earth so for maximum efficiency, the magnetorquers are activated only around the time of perigee, the lowest point in the orbit.

The new schedule essentially slides the Mode L operating period about 20% later in the orbit. This is because the satellite will be nadir pointing (looking directly at the earth's center) later in the orbit. Previously, AO-13 was nadir pointing at apogee.

The attitude of AO-13 is determined primarily by two factors: Location of the sun and location of the earth. Spacecraft controllers must first align the spinning spacecraft's solar panels with the sun to maximize power production. Next, they align the spacecraft so that its antennas point towards earth when possible. Finally, based on the attitude and antenna beam patterns, the controllers determine the operating schedule so optimum use is made of each operating mode (Mode B, J, L and S).

Operating experience with the new schedule and attitude suggest ways of planning your operating activities to minimize the effects of spin modulation. On Mode B, spin modulation becomes a significant factor when the satellite is off-pointed from a ground station using circular polarization when the off-pointing (or squint angle) exceeds about 40 degrees. Stations using linear polarization have a much lower squint angle tolerance. Again it's been demonstrated being able to switch from right hand to left

hand circular polarization is very helpful. Best Mode B operating seems to occur when looking west at the satellite late in the orbit.

The following attitude table was developed by James Miller, G3RUH.

OSCAR-13 Attitude Future Behavior Due To Precession

DATE	SUN ANGLE	ALON	ALAT	ILL %
1988 Oct 10 [Mon]	16.7	209.6	2.1	95.8
1988 Oct 17 [Mon]	19.8	209.7	1.5	94.1
1988 Oct 24 [Mon]	22.6	209.8	1.0	92.3
1988 Oct 31 [Mon]	25.2	209.9	0.5	90.5
1988 Nov 7 [Mon]	27.4	210.0	-0.1	88.8
1988 Nov 14 [Mon]	29.3	210.1	-0.6	87.2
1988 Nov 21 [Mon]	30.6	210.2	-1.1	86.0
1988 Nov 28 [Mon]	31.5	210.3	-1.7	85.3
1988 Dec 5 [Mon]	31.8	210.5	-2.2	84.9
1988 Dec 12 [Mon]	31.6	210.6	-2.7	85.1
1988 Dec 19 [Mon]	30.9	210.7	-3.2	85.8
1988 Dec 26 [Mon]	29.6	210.9	-3.7	86.9
1989 Jan 2 [Mon]	27.9	211.0	-4.2	88.4



Wally, W7KRC and Steve, operating KI7L/7 from Wyoming. (WA7MEK photo)

Short Bursts

- Michael Filipiak, KO9Q, reports was he believes to be the first AO-13 to RS-11 satellite crosslink. Mike says he worked W8VXH on September 5 at 0014 UTC using AO-13 Mode B through to RS-11 Mode A. The 2 meter AO-13 Mode B downlink was picked up by the Mode A receiver on RS-11, he says, and 529 and 539 signal reports were exchanged. The satellites were positioned with AO-13 at 103 W, 34 N and RS-11 at 106 W, 32 N. The frequencies used included 435.481 MHz (Mode B up), 145.915 MHz (Mode B down, Mode A up) and 29.411 MHz (Mode A down). [Other reports of similar crosslinks are believed to have been circulating in Europe recently. Any counter claims?—Ed]

- The first trial run of the ZRO Test took place Saturday evening, September 24. The Mode B run took place under difficult listening conditions since heavy spin modulation reduced readability. Many stations which had previously scored Z-6 levels on AO-10 ZRO Tests reported Z-4 to Z-5 was about all they could manage on Saturday's test due to the spin modulation. The Mode B test will be scheduled after the Mode L episode in the future so pointing angles and the resulting spin modulation will be less a problem ZRO Test officials say.

- The ASR "Tech Tips" column began in 1986 but has suffered from lack of submissions after a half dozen appearances. ASR believes this feature is valuable and would like to continue it but needs your inputs. If readers have ideas and novel approaches to typical problems encountered in OSCAR work, share them.

- G3RUH points out an error in our recent discourse on the AMSAT day number. James correctly points out that 1988 Jan 01 = Amsat Day 3652. However, 1988 Sep 10, which is day-of-year 254 equates to Amsat Day $3652 + 254 - 1 = 3905$, and not 3906 as stated. Thanks to sharp-eyed James M for this correction!

- Bill Brown, WB8ELK, points out his balloon will be launched from Greensburg Indiana, not Illinois as previously reported. The launch was slipped from October 1 to October 8 as of press time.

- Here is the FO-12 operating schedule as provided by JARL.

Mode	Beginning	
	Date	Time
JD	12 Oct	1406
DI	13	1312
JD	15	1325
DI	16	1231
JD	18	1245
DI	19	1151
JD	21	2016
D	22	1922
JA	26	0936
D	27	1043
JA	29	0855
D	31 Oct	0909

JD = Digital mode

JA = Analog mode

D = All systems off

DI = Systems off except CPU and memory

The transponders will be off at other times. The actual operating schedule may change due to unexpected situations such as variations in available power. Mode JA Beacon: 435.795 MHz. Mode JD Beacon: 435.910 MHz.

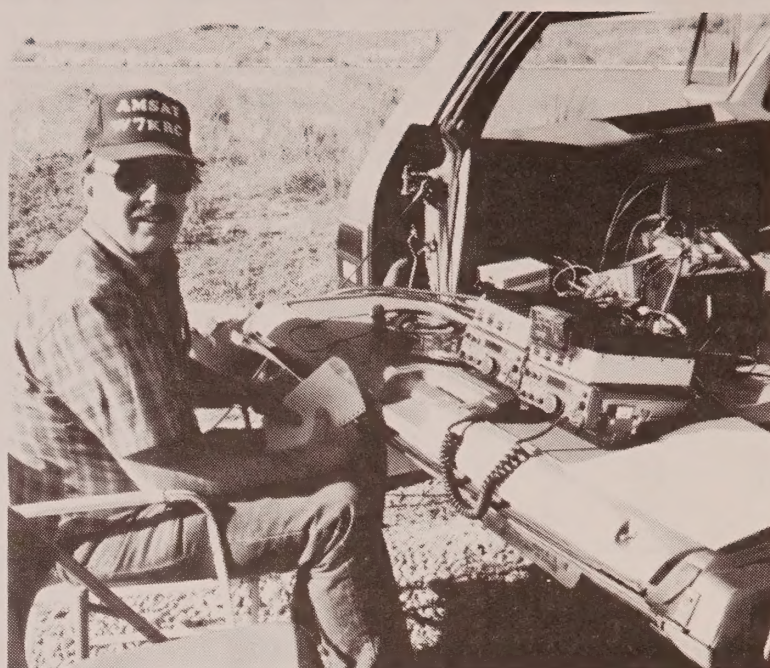
Local Area Voice Nets Build Local Support

by John Champa, K8OCL

Several Detroit-area repeaters have been linked on a recent Thursday evening to afford excellent AMSAT net coverage in southern Michigan. Rich Ensign, N8IWJ, and I act as Net Control Stations. The net meets at 8 PM Eastern time Thursdays on the following frequencies:

W8ICN/R	145.33 MHz	
WA8CTY/R	147.22	
WD8CIK/R	224.46	(Originating Repeater)
N8DXG/R	443.325	
K8OCL	1294.50	

This wide spread/bandwidth coverage produced nearly 40 check-ins dur-



Wally Nelson, operating W7KRC/7 from Wyoming. (KI7L photo)

ing its first night of operation with N8IWJ as NCS. It's hoped this level of participation can be replicated in other major population centers. With the capabilities of AO-10, AO-13, and the up-coming microsats, this grass roots support-building should go a long way towards building the satellite user base and AMSAT membership.

Mode S Test Results

by Bill McCaa, KØRZ

AMSAT OSCAR 13 Mode S transponder tests began September 17. Here is a summary of the results.

PRELIMINARY TRANSPONDER TEST RESULTS:

I found that the transponder passband limits were:

UPLINK	DOWNLINK
435.602	2400.715
435.636	2400.749

(all frequencies corrected for Doppler)

To the negative side, I found the uplink took about +44 dBW (25 kW EIRP) linear polarization uplink) to saturate the transponder. The +44 dBW was obtained using 350 watts into four 4.2 wavelength Yagi's. Any increase in power above this level produced no additional downlink signal. The downlink signal was 6 dB above the receiver noise. I am using a 3 foot dish and a 1.5 dB receiver noise figure.

I heard my downlink signal moments after the Mode-S transponder came on (20:22 UTC 17Sep) and worked VE4MA on CW at 20:25 GMT. I sent a 539 report and received a 569 report from VE4MA. I believe this CW contact is the first QSO on Mode-S. We then tried SSB and VE4MA reported my signal very copyable at 57 on his 12.5 foot dish. I could also copy my SSB downlink but could not copy VE4MA's SSB. I believe VE4MA was using 40 Watts to 8 Yagis on 435 MHz. VE4MA was able to copy his own SSB downlink signal.

At 20:39 GMT I worked WB5LUA on CW. I sent a 519 report and received a 539 report from him. WB5LUA was using a 4 foot dish and 40 watts into a 15 turn helix. WB5LUA was later heard saturating the transponder. However, he was using 800 watts into the helix.

KØKE reported hearing WB5LUA and KØRZ but just heard his own signal as the transponder went off. He was using 40 Watts and four K2RIW 19 el Yagis and receiving on a four foot dish. I heard no other signals during the half hour period. The transponder went off at 20:52 GMT.

The design of the Mode S transponder is such that it is not possible for the beacon to be on when the transponder is on; it cannot be commanded this way. However, since the beacon was on with the transponder I can only guess what might be the cause or problem in the transponder

but this may help explain the additional uplink power required to access the transponder.

When I completed designing the Mode-S transponder and thought about it afterwards, I had wished I had made it possible for the beacon to be on with the transponder. Through whatever unknown mechanism, I guess I got my wish but at the penalty of requiring additional uplink power.

VE4MA estimated my uplink signal (+44 dBW) to be equal to the beacon signal and to be about 24 dB out of the noise on his 12.5 foot dish with circular feed. The sideband signal quality was quite good and he heard no evidence of limiting in the transponder. He could not hear the transponder noise floor.

I received a SWL card from WB5LUA addressed to AO-13 reporting reception of the Mode-S beacon on Sept 6, 1988 at 21:11 GMT on 2400.664 MHz at 10 dB above the noise using a four foot dish, coffee can feed, and ATF-10135 preamp.

Here are lists of the currently active AO-13 Mode S and Mode L stations as compiled by the "sources" indicated.

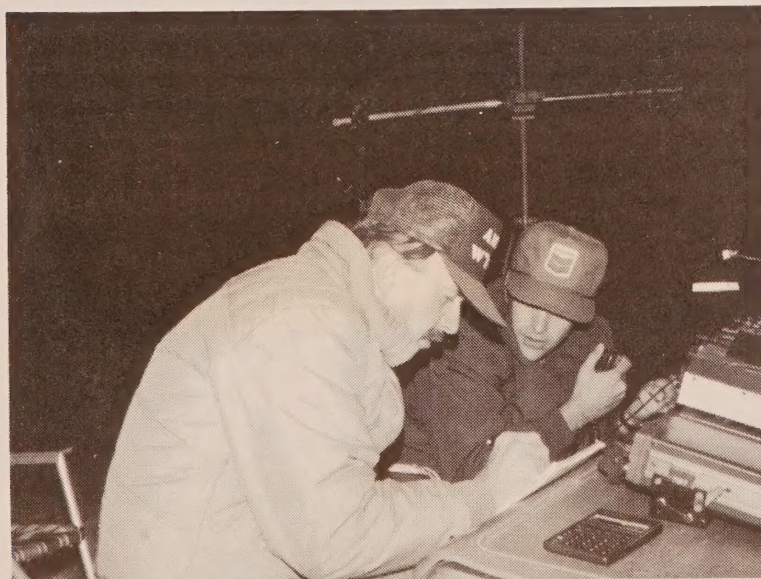
AMSAT AO-13 MODE-S STATION LIST
by William D. McCaa, KØRZ, October 1, 1988
Sources: KØRZ, DB2OS, JR1WZI

CALL	Name	XPDR QRL	Uplink equipment power/ant	Downlink equip ant/preamp NF	Beacon S/N dB
DK2ZF	Rolf	?	?	?	
DF5DP	—	?	?	Yagi 20 dBd Gain	6
G2BFO	David	?	?	?	—
IN3HER	Raimund	?	?	1.5 meter dish	10
JA1UHY	Hisa	y	10 KW erp	2 mtr dish, 0.9	20
JR1WZI	Ken	y	4 KW erp	5 ft dish, 3	10
JA4BLC	Row	y	65 KW erp	40 el loop,	3
JR4AEP	—	y	?	?	—
JR4BRS	Toshe	y	10 KW erp	4 mtr dish,	20
KØKE	Eric	y	40W, 8X K2RIW Yagi	12 ft dish, 0.9	8
KØRZ	Bill	y	750W, 4X15 NBS Yagi	4 ft dish, 1.3	10 *
ON6UG	—	?	?	?	—
VE4MA	Barry	y	800W, 8X Yagi	12 ft dish, 1.0	21
WA3ETD	John	?	?	4 ft dish	6
WB5LUA	Al	y	800W, 10 turn Helix	4 ft dish, 0.8	10
WBØQIY	Doug	?	?	4 ft dish	6

* Includes PSK Telemetry Decode

AMSAT OSCAR MODE-L STATION LIST
by William D. McCaa, KØRZ, October 1, 1988
Sources: KØRZ, W6ABN, W4FJ, JR1WZI
Distribution: W4FJ

CALL	Name	AO-13	Uplink equipment	Downlink equipment
AJ9C	Mike	y	10W, 1X45 loop Yagi	1X19 F9FT, GaAs
DK2UO	Heinz	y	?W, 2 mtr dish	?
DK2ZF	Rolf	y	80W, 2mtr dish	?
DF3XG	Gerhard	y	80W, 1.2 mtr dish	2X9 Yagi
DJ3OS	Bernd	y	500W erp	?
DF4HR	Michael	y	80W, 1X28 el Yagi	?
DF5FP	Burt	y	?	?
DJ5BV	Gerd	y	300W, 4X loop Yagi	4X Quagi
DP5DP	Robert	y	70 W, 2X48 Yagi	?
DL6QO	—	y	?	?
DJ9PC	Peter	y	200W, 3 mtr dish	3 mtr dish
DL9GU	Ed	y	150W, 1.2 mtr dish	4X22 Yagi, GaAs
DL9ZV	Eberhard	y	40W, 1X43 el Yagi	?
F9FT/TK	Franck	y	200W, 2X55 F9FT Yagi	1X21 F9FT, GaAs
G2BFO	David	y	100W, 4X23 F9FT Yagi	4X19 F9FT Yagi, GaAs
G3RUH	James	y	20W, 15T helix	16T helix, GaAs
G4DDK	Sam	y	?	?



Wally, W7KRC and Dave, WA7MEK/7 working JA2ORW. (KI7L photo)

G4JY	Art	y	40W,	?
G5TU	John	y	15W, Twin helix	?
GØDLJ	Pete	y	?	?
GW3XYW	Stu	y	75W, 6 mtr dish	10T helix, GaAs
IN3HER	Raimund	y	100W, 3.2 mtr dish	4X20 Yagi, GaAs
I5CTE	Peter	y	45W, 1.3 mtr dish	1X19 Yagi, GaAs
I5UXJ	Alfred	y	300W, 4X55 el Yagi	?
I7FKQ	Francesco	y	?	?
I8CVS	Dominic	y	100W, 4X23 Yagi	?
JA1NYB	—	y	?	?
JA1SYK	Hiro	y	30W, 2 mtr dish	4X21 Yagi, GaAs
JR1WZI	Ken	y	30W, 1.5 mtr dish	4X15 Yagi, GaAs
JA2ODV	Taro	y	?	?
JA4BLC	Row	y	30W, 2X26 Yagi	2X17 Yagi, GaAs
JA4DNC	Nito	y	20W, 2 mtr dish	?
JR4BRS	Toshe	y	30W, 3 mtr dish	4X21 Yagi, GaAs
JR4GGT	Kaquo	y	?	?
JG6FMH	—	y	?	?
JA7EC	Shoji	y	?	?
JH7JKW	Nikio	y	?W, 2 mtr dish	2X21 Yagi
JAØIXX	Miki	y	30W, 22T helix	4X15 Yagi, GaAs
KA1IFX	Ron	y	10W, 2X44LBX KLM	?
K2RDX/6	John	y	10w, 40T helix	1X36 Yagi, GaAs
KD5RO/2	Dave	y	15W, 1X45 loop Yagi	?
KB6BQQ	Alex	y	80W, s ft dish	2X18C KLM, GaAs
KJ6AL	Doug	y	150W, 2X35 loop Yagi	1X40CX KLM, GaAs
K7WUP	Shirlef	y	75W, 4X35 Quagi's	2X12T Helix
KC7GY	John	y	35W, 2X45 loop Yagi	1X40CX KLM, GaAs
KD7YZ	Bob	y	5W, 12.5 ft dish	1X40CX KLM
KE7NR	Don	y	10W, 2X55 F9FT Yagi	?
KL7GRF	John	y	10W,	?
KL7NO	Al	y	50W, 2X28 loop Yagi	4X18C KLM, GaAs
KL7YV	Frank	y	100W, 2X45 loop Yagi	
K8TL	Tom	y	30W, 1X23 F9FT Yagi	16C Cushcraft
K8YAH	Ron	y	130W, 4X23 F9FT Yagi	4X21 F9FT Yagi
KE9I	Jerry	y	29W, 1X45 loop Yagi	1X19 Yagi, GaAs
KØGCJ	John	y	10W, 1X45 loop Yagi	?
KØKE	Eric	y	50W, 1X23 F9FT Yagi	1X19 K2RIW Yagi
KØRZ	Bill	y	120W, 4X38 loop Yagi	4X15 NBS Yagi, GaAs
KØSMI	Hank	y	4.5W, 4X23 F9FT Yagi	2X430 LBX KLM, GaAs
KAØCIC	Bill	y	10W, 1X55 F9FT Yagi	2X14 Yagi
LU2DDU	Daniel	y	15W, 1X?? Yagi	
LU3DCA	Michael	y	50W, 1X45 loop Yagi	4X19 K2RIW, GaAs
LU3DH	Jack	y	70W, 1X28 loop Yagi	?
LU7DJZ	Ramon	y	100W, 2X25 Yagi	?
N1CHM	Tom	y	13W, 1X44 KLM Yagi	1X44C KLM
N4OUL	Blenn	y	100W, 1X44 KLM Yagi	?
NA6E	—	y	?	?
N9QX	Leo	y	25W, 2X45 loop Yagi	1X19 F9FT, GaAs
NWØX	Charlie	y	9W, 4X38 loop Yagi	1X18C KLM
NYØT	Keith	y	12W, 1X44 KLM Yagi	?
OE5ACL	Karl	y	15W, 4 mtr dish	?
OR9ERC	Eric	y	50W, 1X23 loop Yagi	?
ON6UG	—	y	?	?
PAØSSB	Jan	y	200W, 2 mtr long helix	?
PEØAGO	Tony	y	50W, 2.2 mtr dish	1X24 Yagi, GaAs
UA1ZCL	—	y	?	?
VE2AED	Howard	y	100W, 1X44 loop Yagi	?
VE7CLD	Gunter	y	100W, 12 ft dish	12 ft dish, GaAs
VE7VL	Val	y	20W, 12 ft dish	2X16 KLM Yagi
VK2ALU	Lyle	y	40W, 1.8 mtr dish	2X14 Yagi, GaAs
VK4TL	John	y	?	?
VK5QR	Reg	y	100W, 2 mtr dish	4X10T helix, GaAs
VK7ZSF	Frank	y	?	?
W1NU	Vic	y	7W, 1X45 loop Yagi	?
WA2LQG	Rip	y	250W, 16 ft dish	1X40CX KLM, GaAs
WB3CZG	Ray	y	50W, 4XF9FT Yagi	?
WA3ETD/1	John	y	150W, 2X24 loop Yagi	2X18C KLM, GaAs
W3KH	Buck	y	20w, 5 ft dish	88 el J-Beam
WA3WBU	John	y	30W, 2X45 loop Yagi	?
W4AUZ	Shep	y	10W, 1X45 loop Yagi	1X18C KLM, GaAs
W4FJ	Ted	y	90W, 4X23 F9FT Yagi	10T Helix
WD4FAB	Dick	y	15W, 1X45 loop Yagi	?
W4ODW	Gene	y	40W, 4X45 loop Yagi	4X19 K2RIW Yagi
W4OFS	Harry	y	100W, 2X45 loop Yagi	8X19 K2RIW Yagi
W4WSR	Ott	y	80W, 4X Quagi's	2X12 K2RIW, GaAs
W4ZPG	John	y	80W, 2X45 loop Yagi	?
WD5GQM	Fred	y	60W, 4X26 loop Yagi	4X13 Yagi, GaAs
W5HEZ	Jack	y	10W, 4XF(FT) Yagi	?
W5IU	Keith	y	10W, 4 ft dish	4X18C KLM, GaAs
W5SXD	Dick	y	10W, 1X44 KLM Yagi	?
WA5ZIB	Andy	y	?	?
W6ABN	Stan	y	50W, 4 ft dish	1X18C KLM, GaAs
W6GHV	Ken	y	10W, 12 ft dish	12 ft helix
W6YQ	—	y	?	?
WB7ABP	Dick	y	15W, 10 ft dish	2X10T helix, GaAs
W7GBI	Charley	y	6W, 25 ft dish	25 ft dish
W7FS	Bill	y	10W, 1X44 Yagi	?
WA8OLM	—	y	?	?
WD9HAK	Emil	y	75W, 8X loop Yagi	4X20 F9FT Yagi
WØEKZ	Bud	y	30W, 12 ft dish	1X40CX KLM, GaAs
WØHHE	Al	y	100W, 20ft dish	20 ft dish, GaAs
WØIT	Stan	y	100W, 1X55 F9FT Yagi	88el J-Beam, GaAs
WØKJY	Jim	y	150W, 1X45 loop Yagi	1X22 K1FO, GaAs
WBØP	Dave	y	?	?
WBØQMN	Tom	y	8W, 16 foot dish	8X30LBX KLM, GaAs
WBØRLY	Joe	y	30W, 4X23 F9FT Yagi	2X416B Yagi, GaAs
WØRUE	—	y	?	?
XE1XA	Max	y	5W, 20 ft dish	?
XE1TU	—	y	?	?
YT3MV	Matjaz	y	25W, 1.2 mtr dish	10T helix (in USA)
ZL1AOX	Ian	y	?	?
ZL3AAD	Graham	y	2W, 20 ft dish	
ZS6AXT	Ivo	y	100W, 1.5 mtr dish	19el Yagi

World Space News Summary

The U.S. is back in the manned space business with a rousing success scored launching shuttle Discovery, STS-26. Launch took place at 1537 UTC, Thursday, September 29. The launch trajectory was completely normal and the worrisome solid rocket boosters performed as designed. Six hours and 13 minutes after liftoff the crew of Discovery deployed the 5,000 pound TDRS-C Tracking and Data Relay Satellite. An hour later the first of two kick motor burns boosted TDRS-C to a higher orbit. Later, a second burn circularized the orbit over the equator. Check-out of the TDRS is now under way. TDRS-A, launched by shuttle in 1983 is now positioned over the Equator north of Brazil. TDRS-B was lost in the Challenger accident in 1986.

Extensive on-air coverage was provided America's return to manned space activity. The NASA-Select channel on SATCOM 2R, transponder 13, provided spectacular views of earth from Discovery as it passed over various tracking stations. Many cable TV stations around the country have opted to carry the mission video. WA3NAN, the club station at the Goddard Space Flight Center, covered the launch on HF from the start.

San Francisco Bay area residents had access to full-mission video courtesy of two ATV repeaters according to Mike Scott, N6GOZ. The Mount Diablo and Black Mountain ATV repeaters carried the video from the NASA Select channel on 427.25 MHz. Amateurs with cable-ready commercial TVs viewed the ATV repeaters by attaching an antenna to the cable TV connector and tuning to cable channel 58.

Discovery landed at Edwards AFB, CA, on Monday, October 3 at 1637 UTC after doing a de-orbit burn over Australia on orbit 64.

Optical visibility of Discovery during the mission was sharply limited due to the low inclination (28 degrees) of the orbit and phasing of orbits with the sun. Observers in southern tier states may have gotten a view before dawn on Monday, October 3, a couple of orbits before the de-orbit burn, however.

The Soviet Union released the first photos of its space shuttle September 29. Called VKK by one Soviet official, the photos were released by TASS about the time Discovery was originally expected to lift off. The photos revealed the Shuttle with its CCCP markings against an evening sky with the Energiya, strap-on liquid boosters, and gantry clearly visible.

Western observers were not surprised to see similarities between the two craft, as the Soviets had already disclosed that the designs followed similar patterns. Soviet space officials have suggested that the Shuttle may be launched by the end of this year and that it will be unmanned, but no date has been announced and they have acknowledged that there are technical problems causing delays.

Israel joined the ranks of the space faring nations Monday, September 19, when it launched a small satellite called Ofeq-1 (Horizon-1) into a low, elliptical orbit. The 343 pound satellite was carried to orbit by a medium range missile known as Shavit (Comet) believed derived from the medium range Israeli missile called Jericho-2. It will study solar effects and the geo-magnetic field from its 1,155 X 250 km (717 X 155 mile) high orbit. This spacecraft has an overall performance in the range of AO-13.

The U.S. successfully launched NOAA-11, a weather satellite, from Vandenberg AFB at 1002 UTC, Saturday, September 24 aboard a refurbished Atlas E rocket. NOAA-11 will operate from a 102 minute, 540 mile circular polar orbit. Besides its weather instruments, NOAA-11 also carries a SARSAT Emergency Locator Transmitter (ELT) receiver. The SARSAT (Search and Rescue Satellite) system in U.S. and Soviet satellites has been responsible for saving at least 1,150 lives NOAA said. The Soviet-Canadian Skitrekks used SARSAT ELT's during their trek last spring. NOAA-11 also carries an instrument to measure atmospheric ozone.

Arianespace has logged another successful launch but one of the payloads is having problems. The V-25 mission, an Ariane 3 rocket, lifted off from the pad in Kourou Thursday evening, September 8 at 2300 UTC carrying the G-STAR III and SBS-5 large commercial communications satellites. While SBS-5 is doing well, the G-STAR payload has experienced an apparent kick motor failure and may be lost.

The U.S. government has given approval for the launch of three large commercial communications satellites by the People's Republic of China. Previously satellite owners were prohibited from exporting their satellites to the PRC. The decision in the Chinese launcher case does not immediately affect possible western satellite launches by the Soviet Union which the U.S. government currently prohibits under all circumstances.

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